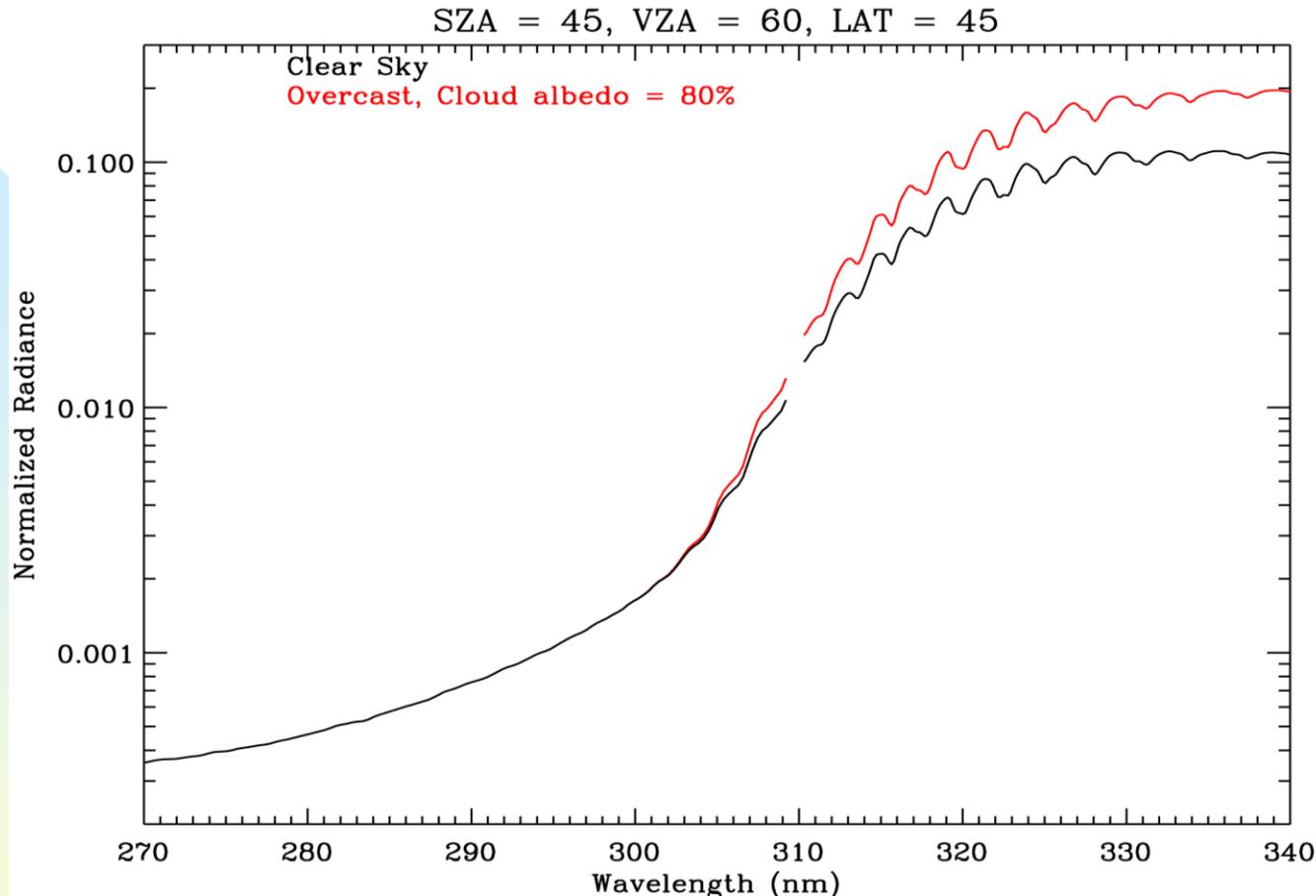


Recommendations for the Geostationary UV Spectrometer

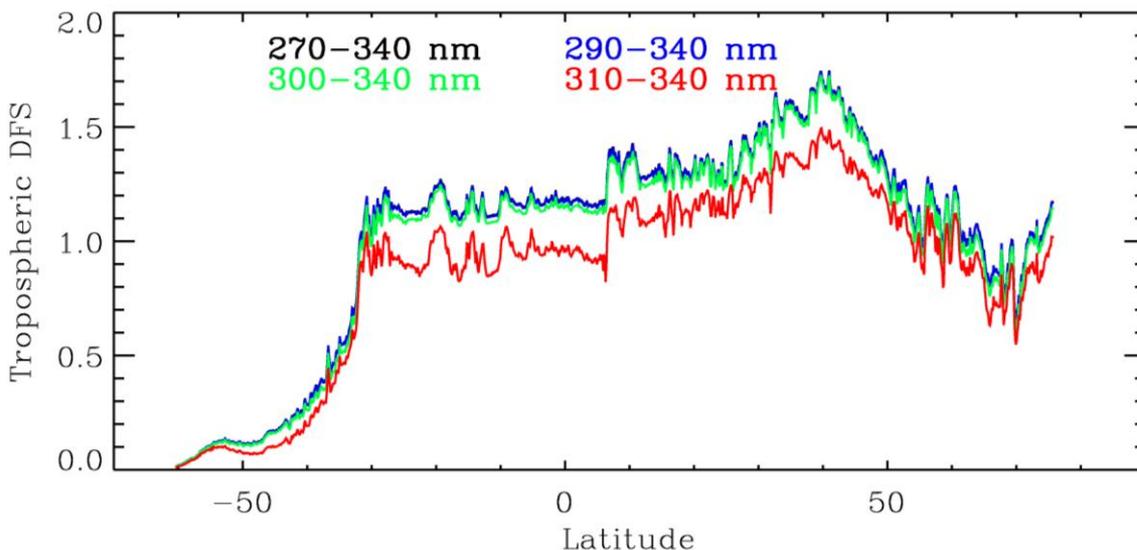
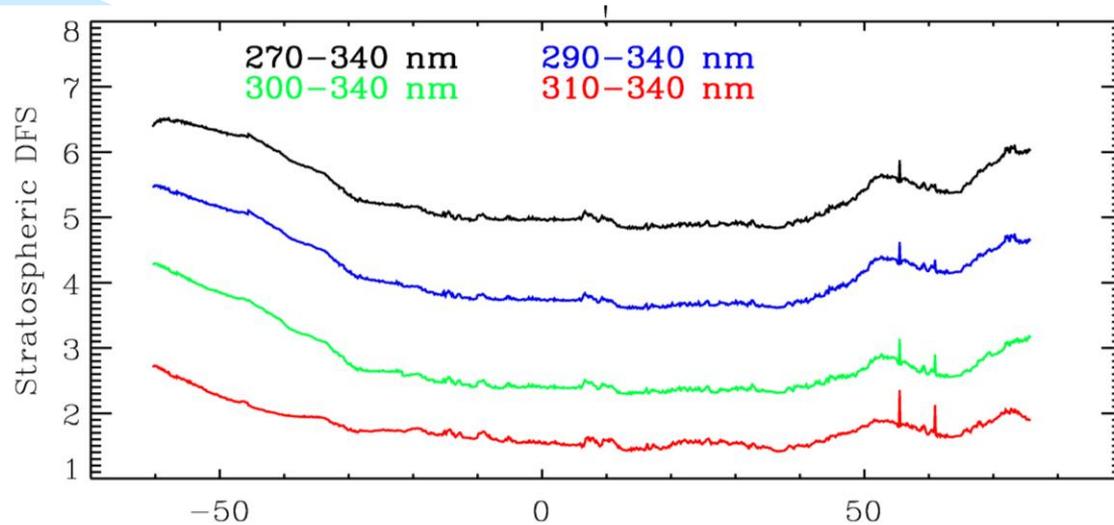
Xiong Liu and P.K. Bhartia

What Wavelength to Begin for GEO UV Channel?



- Radiances vary by several orders of magnitude over 270-340 nm.
- Including shorter wavelengths increases ozone information at higher altitudes, but complicates instrument design (e.g., two focal planes instead of one focal plane) and increases the cost.

DFS vs. Spectral Region

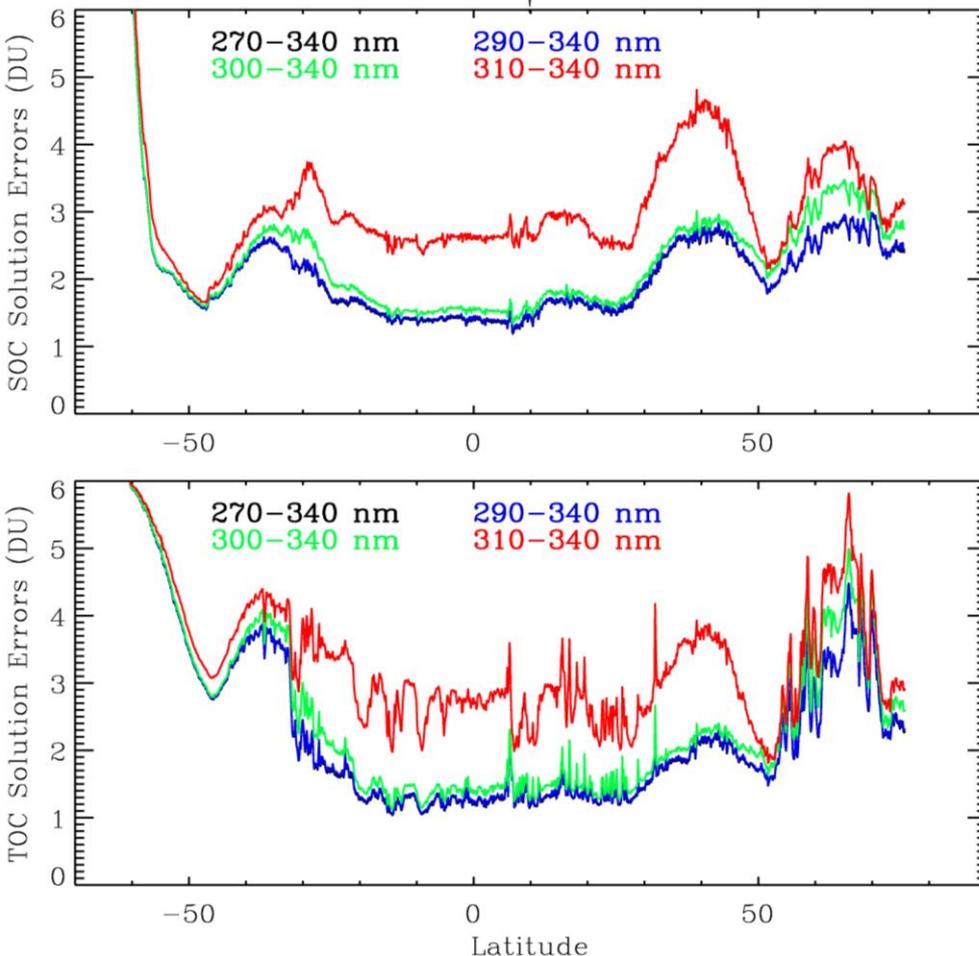


■ **DFS:** Number of useful independent quantities there are in the measurement.

■ Starting from 300 nm, essentially no tropospheric ozone information is lost

■ Even starting from 310 nm, tropospheric DFS is only reduced by ~ 0.2 .

Retrieval Errors vs. Spectral Region



Solution errors: root sum square of random-noise and smoothing errors

- Starting from 300 nm, retrieval errors in SOC & TOC don't increase.
- Errors for starting at 310 nm almost double.
- Start from at least 300 nm to keep all the trop. O₃ information.
- Radiances at 300 nm is smaller by 200-400 than 340 nm radiances, need 2 separate channels?
 - ✚ SNR can be 100 at 300 nm if the SNR at 340 nm is 1500-2000, good enough for tropospheric O₃ retrievals.
 - ✚ Difficult to avoid systematic differences between two channels
 - ✚ Algorithm developer can choose spatial coadding
- The UV channel can be measured within one channel.